

Noise Pollution Negatively Affects Woodland Bird Communities, According to CU-Boulder Study

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A new University of Colorado at Boulder study shows the strongest evidence yet that noise pollution negatively influences bird populations, findings with implications for the fate of ecological communities situated amid growing urban clamor.



The study also is the first to indicate that at least a few bird species opt for noisy areas over quiet ones, perhaps because of their vocalization pitches, a reduction in nest predators and less competition from other songbirds that prefer quiet environments.

The three-year study compared nesting birds inhabiting pinyon-juniper woodland sites surrounding natural gas extraction sites and their noise-producing compressors with birds nesting in adjacent, quieter woodland sites. While bird species richness declined at noisy sites, the bird nesting success was higher there than in the nearby quiet sites, said CU-Boulder doctoral candidate Clinton Francis, lead author on a study published online July 23 in Current Biology.

"This is the first study to show that noise pollution causes changes in species interactions within bird communities," said Francis of CU-Boulder's Department of Ecology and Evolutionary Biology. "Since noise pollution can be a major cause of declining bird diversity in and around urban areas, better noise control using quieter road surfaces and sound-reducing walls and berms should be considered to help preserve such communities."

Co-authors on the Current Biology study included CU-Boulder Professor Alex Cruz and Fort Lewis College faculty member Catherine Ortega, who received her doctorate from CU-Boulder under Cruz. The study was conducted in a parcel of woodland south of Durango, Colo., just over the New Mexico border.

While other studies have shown noise pollution can have negative impacts on bird species, most have been conducted near heavily used roads, said Francis. The CU-Boulder study is one of the first conducted in a controlled environment -- the team worked with energy companies to shut down gas pad compressors for several hours each week, allowing researchers to identify individual nests and determine nesting success.

The researchers found that 32 different bird species nested in the quiet areas undisturbed by noise pollution, while only 21 species were nesting in the noisy study sites. The team also found only three bird species nested exclusively at the noisy sites, while 14 different bird species nested only in the quiet sites, said Francis.

Though their nests were found on both quiet and noisy sites, two bird species preferred the noisy sites, he said. Ninety-two percent of the black-chinned hummingbird nests and 94 percent of house finch nests in the two study areas were found at sites near noisy compressors. The two species accounted for 31 percent of the nests at the noisy sites, but less than 3 percent on the quiet sites, said Francis.

Francis said house finches and black-chinned hummingbirds produce vocalizations at higher acoustic frequencies than those generated by compressors, which may allow them to communicate above the "industrial rumble" and subsequently nest there, he said. Common in congested urban areas, house finches also are known to sing at higher frequencies in response to urban noise, said Francis.

<http://www.colorado.edu/news/p/def218c0e10cad9c7bda09e10393a9eb.html>

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B-022-001: Comment Noted (In Review)

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The Environmental Impact Statement is anticipated to be completed in late 2010 and will be available at <http://www.usda.gov/rus/water/ees/ea.htm>.

Higher nesting success at noisy sites by house finches, black-chinned hummingbirds and of other species was due to lower levels of predation by a major nemesis of the birds -- the western scrub jay -- which was shown to prefer the quiet woodland sites.

Western scrub jays, which are known to prey on eggs and young of songbirds, play a key role in Southwest woodland ecology, said Francis. They were shown to be 32 percent more common in the quiet areas, perhaps in part because some of their vocalizations were in the same range as the compressor noise and inhibited communication.

Since scrub jays frequently carry, eat and cache pine nuts and disperse them throughout Southwest woodland areas, a decrease in scrub jays in such areas could result in the decreased establishment of pinyon pine. This would potentially affect many organisms and alter the dynamics of the ecological community, said Francis.

The team determined that 97 percent of mourning dove nests and 100 percent of black-headed grosbeak nests in the study area were found in the quiet areas away from the din of compressors. Francis said the low vocal frequencies of mourning doves and black-headed grosbeaks appear to overlap with most human-caused noises, which may inhibit vocal communication required for repelling rivals, pairing and nesting.

The study indicated birds that were intolerant of noise and nested in quiet areas were subject to greater rate of nest predation than those in noisy areas, he said. Woodland birds that prefer noisy areas may even use the clamor of civilization as cues for nesting, since such noise might signal a reduction in potential predators.

The researchers also found that a number of bird species found in the noisy sites -- including gray flycatchers, gray vireos, black-throated gray warblers and spotted towhees -- tended to avoid areas of noise disturbance when selecting nesting sites.

"Understanding how birds respond to noise, especially birds with critical links to ecosystems, are crucial in maintaining biodiversity in growing areas of landscapes disturbed by urban clamor," said Francis.

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